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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/939,675	08/28/2001	Kiyoshi Tsuneki	NEG-211US	4863

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EXAMINER	
HEINRICHS, CHRISTOPHER P	
ART UNIT	**PAPER NUMBER**
2663	

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/939,675	TSUNEKI, ET AL.
	Examiner	Art Unit
	Christopher P. Heinrichs	2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/22/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,8-15 and 20-26* is/are rejected.

7)☒ Claim(s) *5-7 and 16-19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 August 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/28/2001*, 7/24/03
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent # 6,385,232 to Terashima.

3. With regard to claim 1, Terashima discloses a cell search method (figs 8 and 9) for use in a CDMA mobile communications system wherein a correlating unit (synchronization detection device of col 9 line 6 and fig 5 item 40) executes despread processing (S10 of fig 5 is the received signal, as stated in col 9 line 8, which is necessarily transmitted as spread for a CDMA system, and the matched filter of fig 6 uses delay shift-registers) utilizing a P-search code (replica code Dcsc, col9 line 17) and calculates a correlation value (col 9 lines 25-26) in a first step of identifying slot timing (as can be seen from fig 8 steps SP5 through SP11, col 9 line 34 – col 10 line 5, and fig 7B, 7C, and 7D, the identification of the CSC permits the identification of GISC in fig 7C, which repeats at intervals identifying the slot timing as seen by correlation values in fig 7D), said correlating unit executes despread processing utilizing an S-search code (replica code Dgisc, col 9 lines 50-51) and calculates a correlation value (col 9 line 53) in the second step of identifying frame timing (timing of long code, col 10 lines 8-12), and said correlating unit executes despread processing utilizing a P-scrambling code (replica code Dlc, col 11 lines 10) and calculates a correlation value (col 11 lines 19-22) in the third step of identifying a scrambling code (long code LC, col 11 lines 37-38).

4. With regard to claim 2, Terashima discloses, as set forth in the rejection of claim 1, a cell search method for use in a CDMA mobile communications system comprising a first step of identifying slot timing, a second step of identifying frame timing, and a third step of identifying a scrambling code, wherein calculation of

correlation values in each of the first, second, and third steps is performed by a correlating unit. Terashima further discloses that a plurality (result of decision SP5 of fig 8 being "NO", another candidate must be checked) of slot timing candidates (which is the set of values to the right of each delay element denoted by the capital D at a given time) are detected at the first step of identifying slot timing (described in the rejection of claim 1, what is described in this rejection takes place during determination of Dcsc) without narrowing results of slot timing identification down to one candidate (again, result of decision SP5 of fig 8 being "NO", another candidate must be checked), said plurality of slot timing candidates being detected in one slot period (clock pulses Dclk will define the periods that comprise each slot) by detecting one candidate (candidate at any given time), for which correlation power indicates a maximum value (Vth1, col 9 lines 19-21 describes the controller setting Vth1 which is the max value indicated by the correlation power for a match of the contents of the shift register and Dcsc), at predetermined constant time intervals (clock pulses Dclk), frame timing identification is performed (as set forth in the rejection of claim 1, wherein frame timing is identified by the identification of a the GSIC) with respect to all slot timing candidates in the second step of identifying frame timing based upon the plurality of slot timing candidates (CSC must be determined from slot timing candidates, and determination of GSIC is immediately subsequent to determination of CSC, therefore it is both with respect to and vicariously based upon the slot timing candidates), and one frame timing candidate (GISC, col 10 lines 1-5) indicative of a maximum value (Vth2) is selected from among a plurality

of candidates (replica code Dgisc, col 9 lines 50-52) for frame timing (as set forth in rejection of claim 1), and correlation power with regard to the one timing candidate selected at said second step is obtained and identification is achieved by rendering a threshold decision at said third step of identifying a scrambling code (correlation power shown in fig 7F, rightmost correlation value, it can be seen that the correlation value appears a time T1 later with regard to the correlation value of GISC of fig 7E, determined after threshold decision, see col 11 lines 32-38, long code is scrambling code).

5. Claims 3, 4, 8, and 12-13 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent # 6,038,250 to Shou, et al.

6. With regard to claim 3, Shou discloses a system that performs a cell search method in which a correlating unit (fig 3 item 61) receiving a baseband receive signal (Ri, col 6 line 4) is provided with a code generator (fig 3 item 19) which generates a P-search code (common short code #0, fig 7 item S21) in a first step of identifying slot timing (chip synchronization, fig 7 item S23), an S-search code (second use of common short code, as "S"-search code stands for secondary, see col 8 lines 30-32) in a second step of identifying frame timing (long code timing, fig 7 item S23), and a P-scrambling code (synthesized code #i, fig 7 item S25) in a third step of identifying a scrambling code (long code, fig 7 item S27), said correlating unit executing despread processing (col 6 lines 13-14) utilizing the P-search code in the first step, despread processing utilizing the S-

search code in the second step and despread processing using the P-scrambling code in the third step (described by all of fig 7); a power calculating unit (fig 3 item 22) which receives a correlation–value output (fig 61 items Si and Sq) from said correlating unit, performs a power calculation, and stores correlation power in a memory (transferred to fig 4 item 4 where it is stored in memory) (see col 8 lines 18-23); a detect unit which searches for a maximum value of correlation powers that have been stored in said memory in said first - third steps (long code synchronization timing determiner, fig 4 item 4, see col 7 lines 16-19); a decision unit which compares the average value of correlation powers that have been stored in memory with the maximum value (long code identifier, fig 4 item 6), using a predetermined threshold coefficient (determined by threshold value calculator, fig 4 item 5, see col 7 lines 23-26), in the second and third steps; wherein in said first step, said detect unit detects one slot timing candidate, which takes on a maximum value, over the duration of one symbol, and detects a plurality of slot timing candidates with regard to a plurality of symbols (repeat of process above, second iteration of short code #0 being the S-search code as "S" stands for secondary, see col 8 lines 30-34); and in said second step frame timing identification is performed with respect to all slot timing candidates based upon the plurality of slot timing candidates, and said detect unit selects one frame timing candidate (long code synchronization timing) indicative of a maximum value from among a plurality of candidates for frame timing (see col 8 lines 34-38).

7. With regard to claim 4, Shou discloses all aspects of the invention of claim 3 and further discloses that said correlating unit creates a correlation power profile based upon the P-search code in said first step (the combination of any number of power values, as are saved as set forth in the rejection of claim 3, constitutes a power profile), said correlating unit being internally provided with a plurality of parallel connected correlators (fig 5 items 71) which execute processing for starting operation chip by chip while each shifts a despreading position by one chip (col 5 lines 55-58), executing despreading over the duration of one symbol and outputting the results (symbol is short code #0, col 8 lines 15-17), said processing being executing successively over one slot comprising a plurality of symbols (col 8 lines 30-32), and after this processing is halted (fig 7 item S24, the above process is halted), the reason it is halted is for, or in order to allow, the processing of the duration of a number of chips equivalent to the number of said plurality of correlators (col 8 lines 43-45), processing similar to that of the preceding slot is executed again in the next slot (col 8 lines 57-59), said processing is executed over a predetermined plurality of slots (fig 6, segment of synthesized code#512 being the final processed code in a predetermined number of slots), thereby completing despreading at a predetermined number of chip positions (chip positions indicated by fig 6 items PN(1)128, PN(1)127, ...PN(1)1), and when calculation of correlation values by said correlating unit and calculation of powers by said power calculating unit (the act of correlating, described more thoroughly in the rejection of claim 3 and in cols 7-8) end (for synthesized code #1) and the correlation powers are written to

said memory at all timings of chip positions of the predetermined number (col 9 lines 25-32), said detect unit starts searching for a maximum value (col 9 lines 54-57), detects one candidate (partial correlation, col 9 line 49), which takes on a maximum value, over the duration of one symbol (M, fig 6) and detects a plurality of candidates with regard to a plurality of symbols (col 9 lines 39-41).

8. With regard to claim 8, Shou discloses all aspects of the method of claim 3 and further discloses that at the time of said third step (fig 7 item S26) a correlation power profile (stored electric power values, fig 7 item S23) based upon the P-search code (common short code #0 of fig 7 item S21) is already created at the timing of the one candidate (maximum, fig 7 item S23) detected at said second step (fig 7 item S23), when calculation of correlation powers by said correlating unit and said power calculating unit ends (calculation of correlation powers ending is a necessary prerequisite to storing electric power values) and the correlation powers are written to said memory (store, fig 7 item S23), said detect unit starts searching for a maximum value and detects one candidate (selects maximum, fig 7 item S23) that takes on a maximum value and said decision unit evaluates the one candidate (determine long code, fig 7 item S27, the determination of long code evaluates the acceptability of the selected candidate) using an average of the power values that have been written to said memory, the maximum value and a predetermined threshold value (fig 7 item S23 and S26).

9. With regard to claims 12 and 13, Shou discloses all aspects of the invention of claims 3 and 4 and further discloses that the detect unit detects one slot timing candidate (selected maximum of fig 7 item S23) over the duration of a plurality of symbols (multiple periods, col 8 lines 30-31) instead of one slot timing candidate over the duration of one symbols in said first step.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 9-11 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #6,038,250 to Shou et al, in view of U.S. Patent #6,798,758 to Chun et al.

12. With regard to claim 9, Shou discloses all elements of the method of claim 3 and further discloses that the cell search ends normally if the maximum value (power value) averaged exceeds a threshold value (fig 6 item S26, "yes") and control is executed to return to said third step (fig 6 items S28 and S29) if the maximum value averaged does not exceed a threshold value (fig 6 item S26, "no"). Shou fails to disclose that the cell search ends if the maximum value

exceeds an average value times a threshold value and control executes if it does not. However, Chun discloses in col 5 lines 25-34 that a determiner determines that a cell search is complete (SEARCH_DONE, col 5 line 32) if the max value divided by an average exceeds a threshold, which is the mathematical equivalent of the max value exceeding an average times a threshold (multiplying both sides of the inequality by the average value, which is multiplying by one). It would have been obvious to one ordinarily skilled in the art at the time of the invention to alter the method step of fig 7 item S26 of the method disclosed by Shou to include the comparison disclosed by Chun to arrive at the method of claim 9. The motivation to do so would have been to minimize the influence of channel distortion in the received signal, as suggested by Chun in the abstract, by using the method disclosed by Chun.

13. With regard to claims 10, 11, 22, and 23 Shou discloses all elements of the method of claims 3 and 4 and discloses the apparatus of claims 14 and 15 as described below but does not disclose detecting a plurality of slot timing candidates over the duration of one symbol. However, Chun discloses that in the first step (fig 3, leftmost column) a detect unit (comparison output unit) detects a plurality of slot timing candidates (items 302) over the duration of one symbol (symbol defined by leftmost lines e^k...e^k-N+1) instead of one slot timing candidate. It would have been obvious to one ordinarily skilled in the art at the time of the invention to use the method and apparatus disclosed by Chun in combination with the method and apparatus disclosed by Shou to arrive at the

inventions of claims 10, 11, 22, and 23. The motivation to do so would have been that the method disclosed by Chun arrives at a single candidate in a later step, but the first step is used to begin a processor efficient comparison process (second step, third step, etc, each step executing a comparison to arrive at the maximum value in the (log2 N)th step). This competitive style of comparison process allows circumvention of other processor intensive methods of determining a maximum value, which helps processor efficiency.

14. Claim 14-15, 20-21, and 24-26 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent #6,038,250 to Shou, et al.

15. With regard to claim 14, Shou discloses a cell search apparatus comprising a code generator (fig 3 item 19) which generates a P-search code (common short code #0, fig 7 item S21) in a first step of identifying slot timing (chip synchronization, fig 7 item S23), an S-search code (repeat of process above, second iteration of short code #0 being the S-search code as "S" stands for secondary, see col 8 lines 30-38) in a second step of identifying frame timing (long code timing, fig 7 item S23), and a P-scrambling code (synthesized code #i, fig 7 item S25) in a third step of identifying a scrambling code (long code, fig 7 item S27), and a plurality of correlators arranged in parallel (fig 5), said correlating unit executing despread processing (col 6 lines 13-14) utilizing the P-search code in the first step, despread processing utilizing the S-search code in

the second step and despread processing using the P-scrambling code in the third step (processing is described in fig 7). Shou also discloses a power calculating unit (fig 3 item 22) which calculates correlation power from the output of said correlating unit and outputs the calculated correlation power (see col 8 lines 18-23), a memory which stores the output of said power calculating unit (fig 4 item 4), a detect unit which searches for a maximum value of correlation powers that have been stored in said memory in each of the first, second, and third steps (long code synchronization timing determiner, fig 4 item 4, see col 7 lines 16-19); a decision unit which compares the average value of correlation powers that have been stored in memory with the maximum value (long code identifier, fig 4 item 6), using a predetermined threshold coefficient (determined by threshold value calculator, fig 4 item 5, see col 7 lines 23-26), in the second and third steps; and a control unit (fig 3 item 14) which controls operation timing of each of the said units (oscillator controls timing of signals Ri and Rq of fig 3, said timing cascading throughout all other elements through the signal, having effect on the result of the circuits operation). Shou fails to disclose that the plurality of correlators and code generator be combined into one unit. However, it would have been obvious to one ordinarily skilled in the art at the time of the invention to combine the plurality of correlators and the code generator into one correlating unit to arrive at the invention of claim 14. The motivation to do so would have been to conserve space and electric power consumption by using a single IC in place of two.

16. With regard to claim 15, Shou discloses the apparatus of claim 14 and further discloses that the apparatus performs the method of claim 4, which corresponds to the further limitations of the behavior of the apparatus of claim 14 as set forth in claim 15, and is therefore rejected on the same grounds as the rejection of claim 4.

17. With regard to claims 20-21, Shou discloses the apparatus of claim 14 and further discloses the elements of the apparatus of claim 20 as set forth in the rejection of claims 8-9, the elements being the correlating unit and decision unit devices that perform the method steps as set forth in the rejection of claim 8 and the means for exercising control being the decision unit.

18. With regard to claims 24 and 25, Shou discloses the apparatus of claims 14 and 15 and further discloses that the detect units executes as described in claims 24 and 25 as set forth in the rejection of claims 12 and 13, respectively.

19. With regard to claim 26, Shou discloses the apparatus of claim 14 and further discloses in the description of the related art that the mobile station of fig 1 item 64 performs the cell search, and in the first paragraph of the brief summary that the invention is an improved cell search.

Allowable Subject Matter

20. Claims 5-7 and 16-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Suzuki et al (U.S. 6,879,575), Code Division Multiple Access Communications System

b. Higuchi et al (U.S. 6,167,037), Signal Transmitting Method, Transmitter, Receiver, and Spread-Spectrum Code Synchronizing Method for Mobile Communication System

c. Ozukturk et al (U.S. 6,885,652), Code Division Multiple Access Communication System

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P. Heinrichs whose telephone

number is 571-272-8397. The examiner can normally be reached on Monday through Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Heinrichs
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RICKY NGO
PRIMARY EXAMINER

5/12/05